

NASA Human Health and Performance Center

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The NASA Human Health and Performance Center (NHHPC) provides a collaborative, virtual forum to integrate all disciplines of the human system to address health and performance topics and issues related to space flight, aviation, and extreme Earth environments. The NHHPC serves a vital role as integrator, convening members to share information and capture a diverse knowledge base while allowing parties to collaborate on the most important human health and performance topics of interest to members. The center and its member organizations address high-priority risk reduction strategies, including research and technology development, improved medical and environmental health diagnostics and therapeutics, and state-of-the-art design approaches for human factors and habitability. The NHHPC focuses on a number of collaborative projects on human health and performance including workshops, education and outreach, information sharing and knowledge management, and research and technology development projects to advance the study of the human system in extreme environments.

Goals

The goals of the NHHPC are to:

- integrate relevant human health and performance efforts across NASA and with member organizations;
- develop and advance human system research and technology, process, and practice innovations;
- foster development of collaborative projects to enable human space flight capabilities and to address broader national human health and performance needs;
- serve as a focal point for information sharing and knowledge management through in-person and virtual forums.

Themes

The NHHPC develops and implements innovative projects and initiatives that address human health and performance themes.

Topics in health include development of novel and improved health care for humans during space flight, for crew and passengers in civilian and commercial aviation,

and for workers in many aspects of occupational medicine. Collaborative projects in global medicine and general preventive health will also be pursued.

Topics in performance address development of innovative and advance human performance technologies to improve the safety and efficiency of humans living and working in space and on Earth—including the performance of all human interactions with systems such as flight crews, ground controllers, and ground maintenance personnel; development of dual-use space flight and global performance technologies.

Topics in habitability, environment, and human systems engineering include the development of information, technologies, and processes aimed at making the habitable environment safe and conducive to productive work and healthy living.

Topics include those that enhance the coordination of education and outreach initiatives that address grades K-12, the university level, professional training, and public outreach. A particular emphasis will be placed on K-12 science, technology, engineering, and mathematics education. New initiatives will be based on established local, national, and international member organization programs, and may be offered through the NASA Space Life Sciences Academy or from member organizations.

Topics in research and development include fundamental biology for space and global applications, mechanistic research such as biomarkers and common signaling pathways, and breakthrough research such as synthetic biology projects. These efforts will be evidence-based, using a standards-to-deliverables process that results in solutions aimed at mitigating the highest priority human system risks.

Various platforms will be used for NHHPC human health and performance projects including ground-based facilities of NHHPC members; government spacecraft, including the International Space Station National Laboratory; commercial spacecraft; and commercial aviation.

The NHHPC collects, integrates, and disseminates knowledge, best practices, and advancements among all elements of the human system to advance research,

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technology development, requirements development, and innovative human health and performance solutions, including the areas of fundamental biology and space cell science.

Website and Collaborative Tools

The NHHPC is primarily “virtual.” Development and administration of an interactive website along with other supporting collaborative tools are critical to integration of information and leveraging human system efforts across its member organizations. The NHHPC website serves as the official gateway to a combination of collaborative tools and repositories to facilitate member recruitment, knowledge collection and dissemination, collaboration, and strategic communications.

The NHHPC website and collaborative tools supporting operations enable knowledge and information sharing among member organizations; provide the appropriate level of security yet still provide flexibility to support NHHPC operations and information release processes; provide a user-friendly mechanism to enhance traditional forms of communications and partnerships; and provide dynamic resources to support effective virtual and in-person forums. It also facilitates secure integration and coordination of NASA center business functions (such as responses to agency budget calls); provides virtual collaborative partnership capabilities that enhance the visibility of all NHHPC member organizations where possible; and supports future enhancements such as multilingual capability and user profiling to present information specific to user needs and preferences (<http://www.nasa.gov/offices/NHHPC/index.html>).

Expectations are that the majority of information exchanged as part of NHHPC operations will be public information with no sensitive or business proprietary governing requirements. All data and information on the public website will be screened and released or protected according to existing NASA protocols. Where data/information require specific protection, the appropriate processes and tools will be identified to ensure secure information exchange and appropriate markings and release.

Summary

The NHHPC convenes members from diverse organizations that share a common interest in developing collaborative and innovative approaches to enable human health and performance in many uniquely stressful environments on Earth, and in many aerospace realms from aviation, to suborbital, to orbital and planetary flights. Lessons learned in any one environment can be rapidly shared with members to enable more efficient development of research and technology proposals as well as effective mitigation applications for human health and performance risks. Members benefit by participating in the sharing of a diverse and integrated knowledge base, as well as developing collaborative projects that make maximum use of the resources of all participating members.